**Glycolysis** True or false. If false, indicate why

1. _______ Glycolysis takes place in the cristae of mitochondria
2. _______ An end product of glycolysis is pyruvate
3. _______ A 6 carbon sugar is oxidized in glycolysis
4. _______ CO₂ is a waste product of glycolysis
5. _______ _sugar + NAD⁺ → pyruvate + NADH + 2 ATP represents glycolysis
6. _______ Glycolysis leads to fermentation in some bacteria and yeast
7. _______ Glycolysis involves an energy pay-off and then an energy investment phase
8. _______ A net of 4 ATP are produced in glycolysis
9. _______ Pyruvate contains 3 carbons
10. _______ Glycolysis involves 10 steps tightly controlled by enzymes
11. _______ Glycolysis is an exergonic process that releases energy
12. _______ Glucose is modified to form acetyl CoA for the citric acid cycle
13. _______ Glycolysis does not use oxygen, it is anaerobic
14. _______ Glycolysis is the first step in cellular respiration
15. _______ It is likely that glycolysis was the method of ATP production in first organisms on Earth.
16. _______ Organisms that engage in glycolysis cannot engage in fermentation

**The Citric Acid Cycle** True or false. If false, indicate why

1. _______ The purpose of the citric acid cycle is to remove excess oxygen from cells
2. _______ The initial molecule in the citric acid cycle is acetyl-CoA
3. _______ The citric acid cycle occurs in the inner membrane of the mitochondria
4. _______ 1 glucose molecule leads to 2 turns of the citric acid cycle and produce 2 ATP
5. _______ The citric acid cycle is a loosely controlled series of enzymatic steps
6. _______ All living organisms engage in the citric acid cycle
7. _______ Carbon dioxide is produced in the citric acid cycle
8. _______ Electron carriers oxygen and water are produced in the citric acid cycle
9. _______ The citric acid cycle is the second step in cellular respiration
10. _______ The citric acid cycle is also called the tricarboxylic acid cycle

**Oxidative phosphorylation** True or false. If false, indicate why.

1. _______ Oxidative phosphorylation involves the electron transport chain
2. _______ Oxidative phosphorylation occurs in the cytoplasm
3. _______ Oxidative phosphorylation is an aerobic process
4. _______ Ca⁺² ions are pumped into the mitochondrial matrix during electron transport
5. _______ Electrons are donated by NADH and FADH₂
6. _______ Energy is harvested in a step wise fashion
7. _______ Water is produced in oxidative phosphorylation
8. _______ ATP is broken down to 34 ADP + 34 P in oxidative phosphorylation
BIO 101 Worksheet Metabolism and Cellular Respiration

9. _______ ATP is synthesized by a ATP synthase
10. _______ ATP synthase requires H+ ions to operate
11. _______ The total amount of ATP produced by all cellular respiration activities is ~ 24
12. _______ Cellular respiration can be represented by: C₆H₁₂O₆ + CO₂ → O₂ + H₂O + energy
13. _______ Oxidative phosphorylation cannot occur in prokaryotes
14. _______ Mitochondria are located in the plasma membrane of eukaryotic cells
15. _______ One cell may have thousands of mitochondria
16. _______ lipids, carbohydrates, and proteins can serve as fuel for cellular respiration

**Fermentation** True or false. If false, indicate why

1. _______ Fermentation is linked to the citric acid cycle
2. _______ Fermentation may produce ethanol
3. _______ Yeast and bacteria engage in fermentation
4. _______ Human cells can engage in fermentation
5. _______ Obligate anaerobes engage in fermentation
6. _______ Fermentation begins with pyruvate
7. _______ Fermentation does not produce CO₂
8. _______ Fermentation occurs in the cytoplasm
9. _______ Fermentation cannot produce ATP
10. _______ Fermentation is linked to glycolysis